



# The Artificial Intelligent Loan Marketing System: Integrating Predictive Modeling and Generative AI

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Cathay life insurance/ Data scientist





# Agenda

- 1. About Cathay Life Insurance & Presenter**
- 2. Introduction & Background**
- 3. AILMS – GBDT Model**
- 4. AILMS – GenAI**
- 5. Conclusions**

# About Cathay Life Insurance & Presenter

# About Cathay Life Insurance

## Company Snapshot

- Largest insurance company in Taiwan
- Offers individual life, health, unit-linked, and group insurance products

Number of Customers

8 million

Num. of In-force Policies

20 million

Total Assets (US\$)

280 billion

Number of Tied Agents

24,000

## Awards & Recognition

**IIC ASIA 2025**

**InsurInnovator Connect Awards 2025**

Digital Transformation Trailblazer Award



2025  
&  
2024

**ITC Asia Insurer Awards**

(2025) Digital Transformation Trailblazer Award  
(2024) Data and Analytics Master Award



2024  
&  
2023

**Celent Model Insurer Awards**

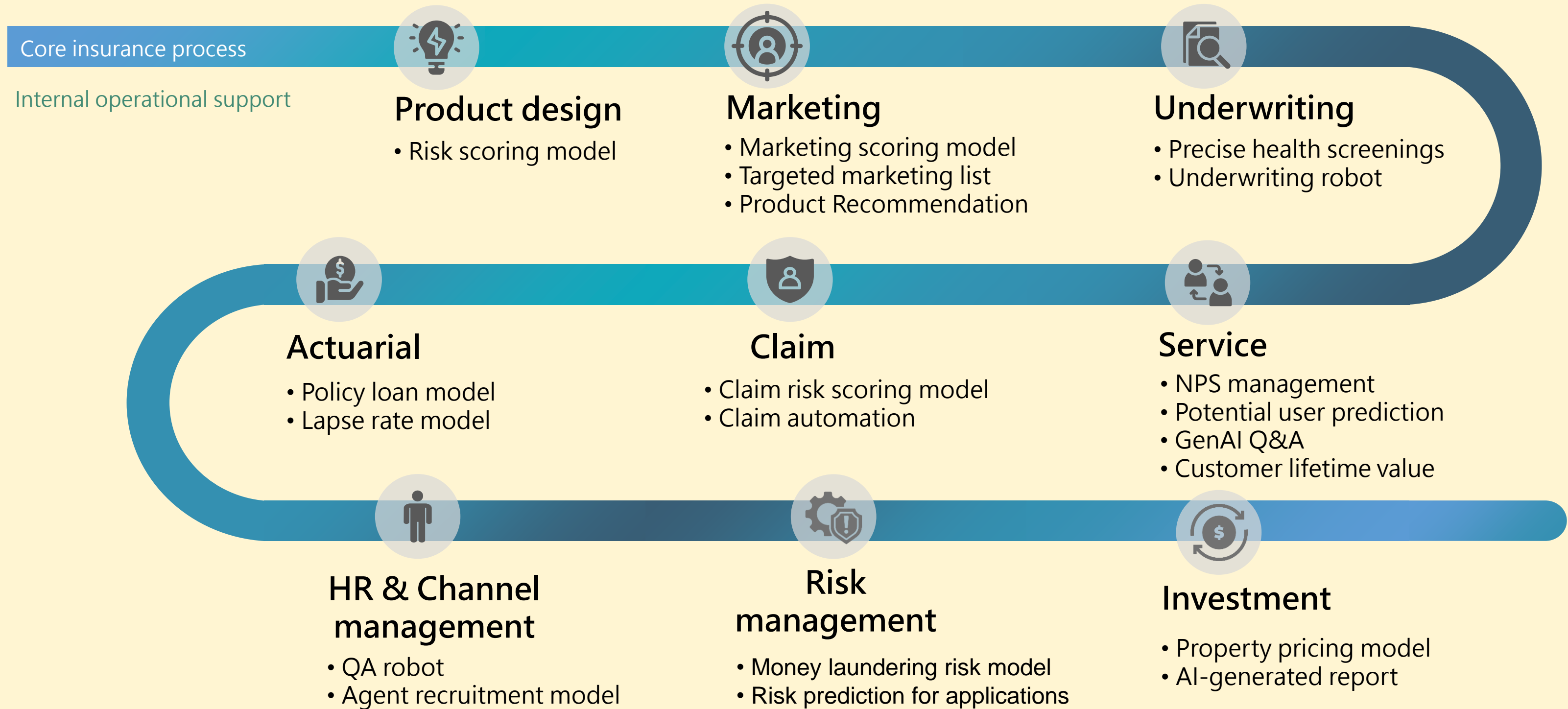
Data, Analytics and AI



**AIIA 2022**  
Digital Insurer of the Year

# AI-powered Insurance and Actuarial Work

The demand for AI is growing day by day, and Cathay Life currently has over 40 AI products.



# About the Speakers



**Kansheng Hsu**

Data Scientist,  
Data and AI Development Department



**Ting-Hsuan Liu**

Senior Business Analyst



**Yi Ping Bai**

Senior Data Scientist



**Chiao Ju Yang**

Data Scientist

# Introduction & Background



# Overview of This Study

## Objective

Develop Artificial Intelligent Loan Marketing System(AILMS) to predict policy loan demand and generate personalized marketing content using AI, improving marketing accuracy and helping non-technical users make better data-driven decisions.

## Methodology

AILMS uses a GBDT(Gradient Boosted Decision Tree) model to predict loan demand, integrates Text2SQL for natural language queries, and applies Generative AI to create customized marketing content for different customer segments.

## Significance

AILMS improves customer targeting, simplifies data access for marketing teams, and enhances workflow efficiency by automating key marketing processes, reducing manual effort, and ensuring better engagement with potential customers.



# Background - Industry Challenges

## IFRS 17 Implementation

- Enforced in 2026, requiring stricter Asset and Liability Management (ALM).
- Helps insurers build more accurate reserves, reducing liability volatility under IFRS 17.
- Promotes better utilization of idle funds to generate additional interest income.

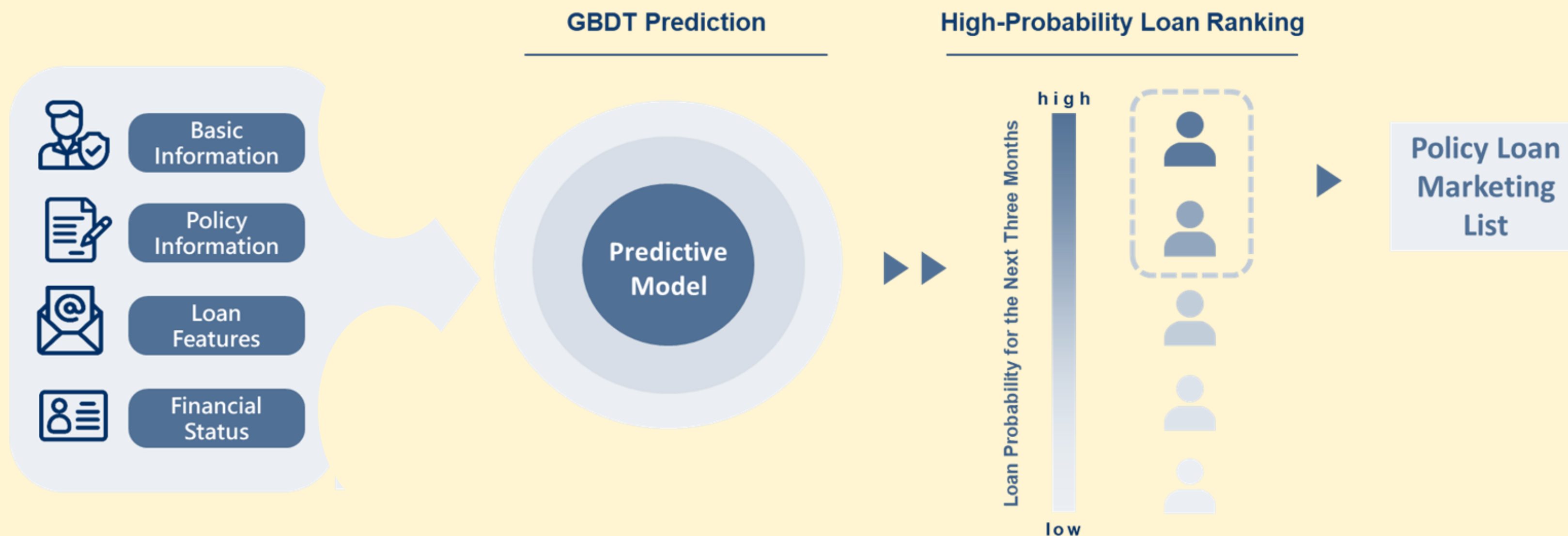
## Challenges

- Policy loans are used by only a small number of customers, with little increase in loan amounts.
- Unstable loan demand makes it hard to know who's likely to borrow.
- Manual work is slow and can't create personalized messages.
- Marketing teams can't easily get the data they need.
- It takes too long to adjust marketing when customer needs change.

# AILMS - GBDT

# Predictive Modeling with GBDT - Overview

The GBDT model calculates and ranks policyholders' loan probabilities, identifying high-probability borrowers for targeted marketing.





# Data and Variables

- This study used data from about 5,000,000 policyholder customers who were eligible for loans as of February 2023.

- Variables:



## Basic Information

- Age
- Gender
- Education Level
- Occupation Category



## Policy Information

- Credit Card Payment Status
- Number of Main Policies Held
- Age at First Insurance Purchase
- Past Payment History



## Loan Features

- History of Policy Loans
- Loan Applications in the Past Year
- Investment Topic Browsing in the Past Six Months

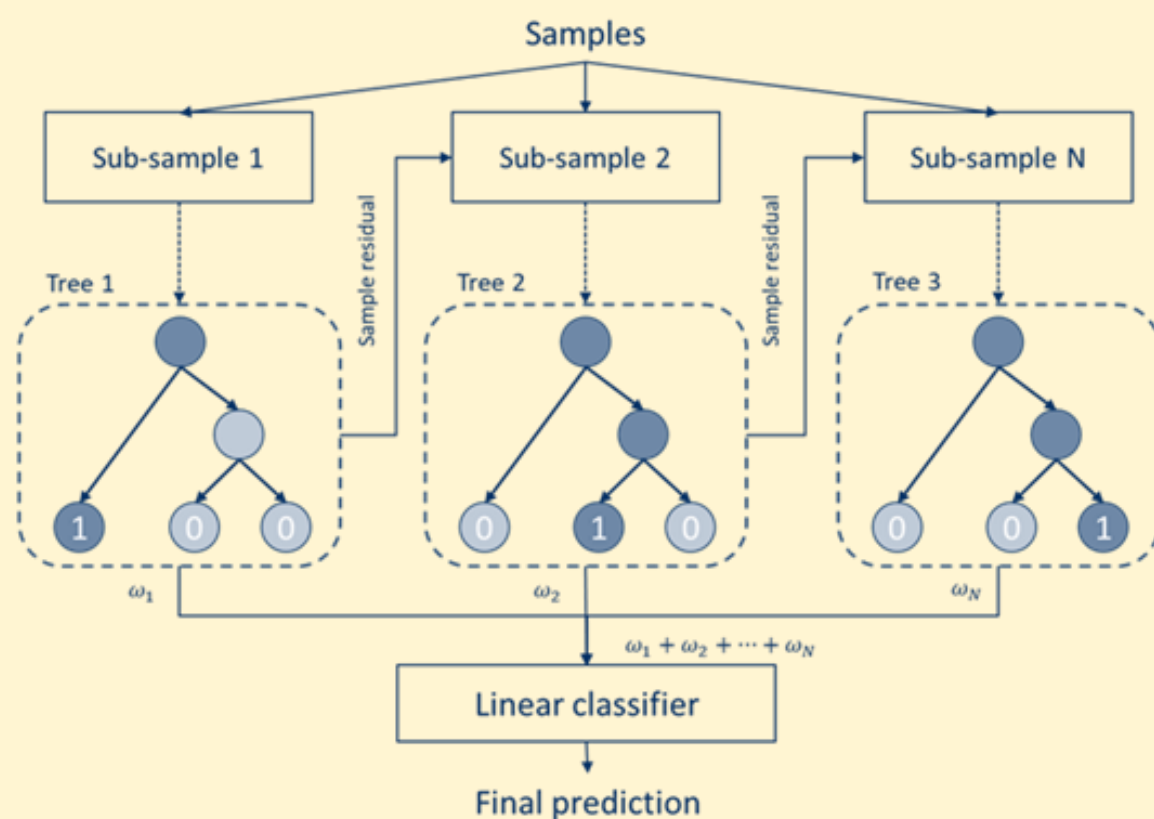


## Financial Status

- Annual Income
- Policy Value for the Current Year
- Maturity Payout Status

## Gradient Boosting Decision Tree(GBDT)

- A machine learning algorithm builds multiple decision trees to improve prediction accuracy.
- It works sequentially, with each tree correcting errors from the previous one.
- It handles complex patterns well and is robust to missing data.



## Framework

- Prediction Target: Policyholder's Policy Loan Probability in the Next Three Months
- $\begin{cases} Y = 1: \text{At least one policy loan record within three months} \\ Y = 0: \text{No policy loan record within three months} \end{cases}$

$f(x)$  which is GBDT

→ Y

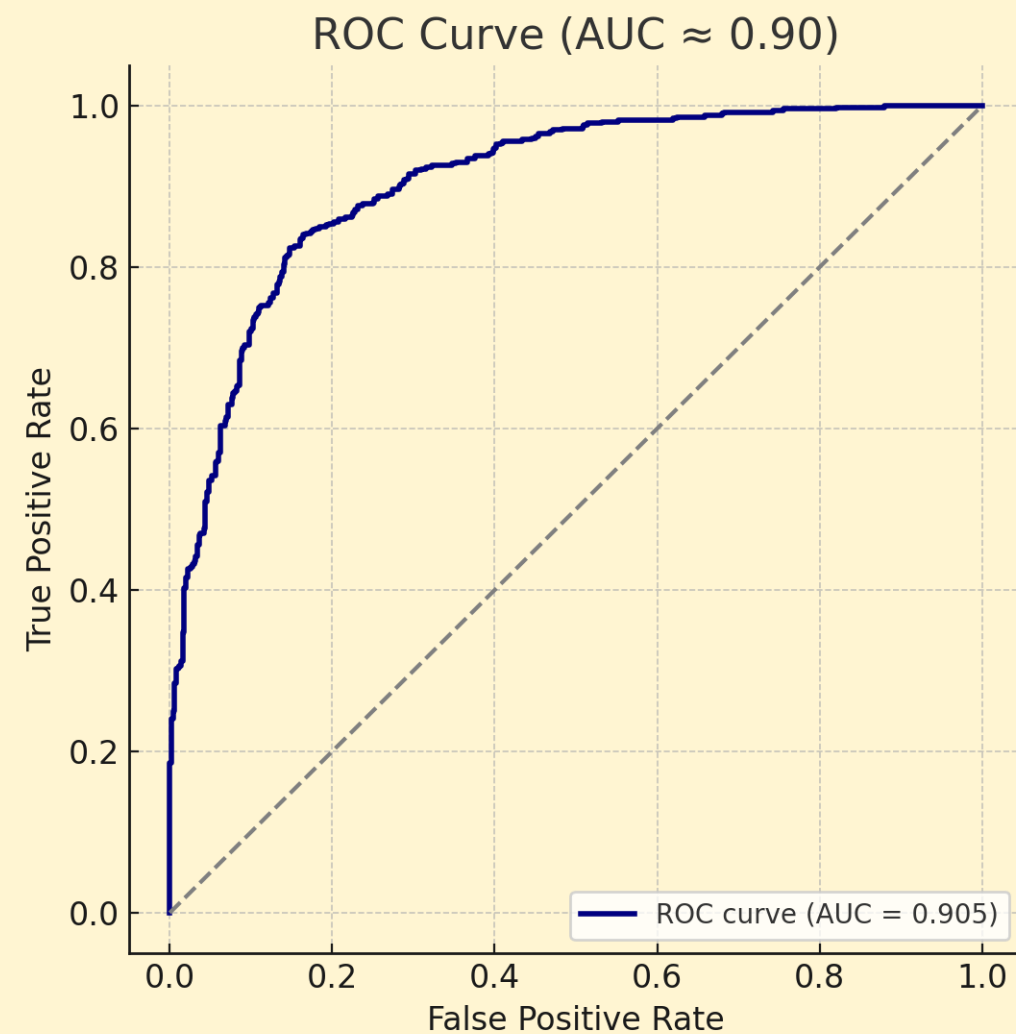
ID	x1	x2	...	x355
ZD9088QJA0				
....				
9998887777				
....				

Y
0
0
1
0

# Model Result

## ► Index 1: AUC (Area Under the ROC Curve)

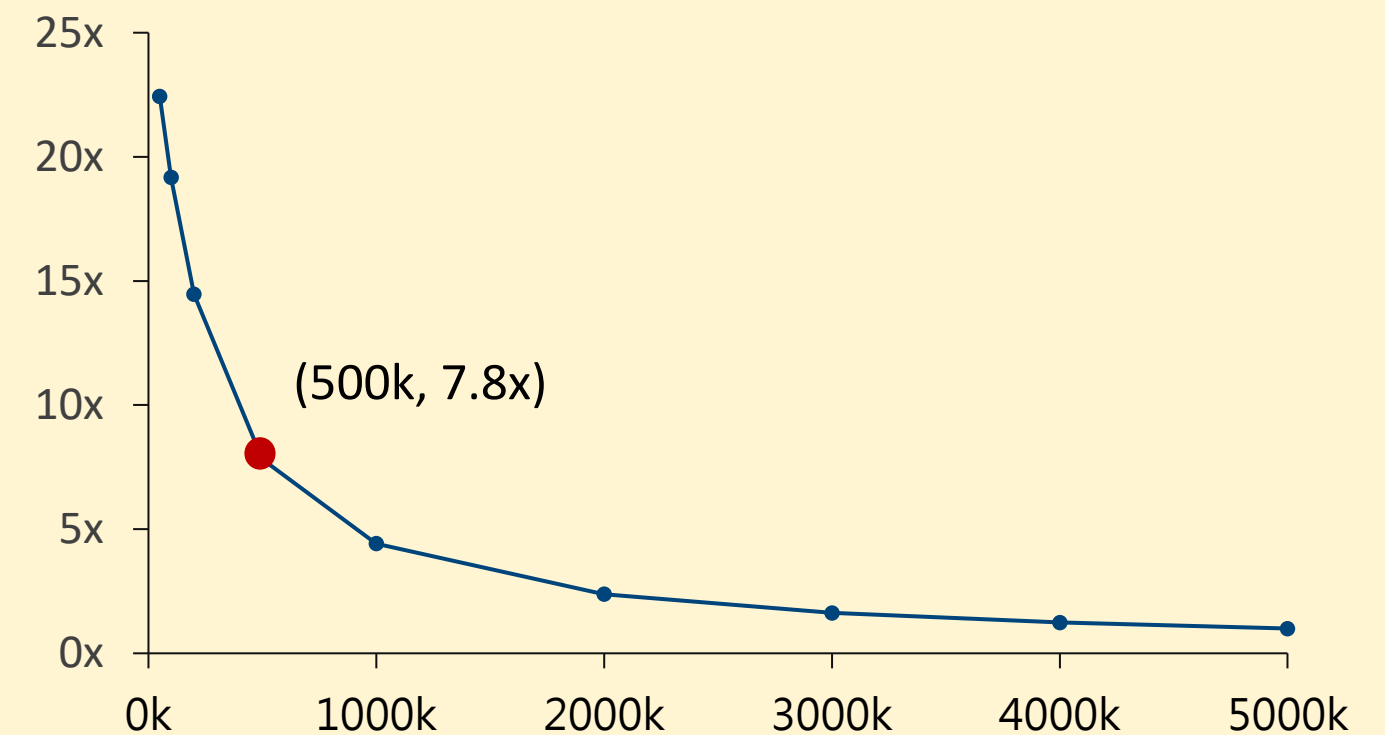
AUC ranges from 0 to 1, with values closer to 1 indicating better predictive performance.



## ► Index 2: Loan Lift Ratio

i.e.  $\frac{\text{actual loan probability of the selected list}}{\text{actual loan probability of the overall market}}$

A higher lift ratio indicates better predictive performance of the model.





# Model Explainability

The following are the top 10 most important variables affecting the prediction values.



# AILMS - GenAI

# AILM with GenAI - overview

Marketing  
Planner



" Show the top 2,000 male customers aged 30 to 40 living in Taipei City with the highest loan probability. "



Text2SQL  
Engine



- A tool that lets users query databases using natural language, no coding needed.
- Automatically converts natural language into SQL queries.



Database  
Query



Queries model prediction results and customer database.



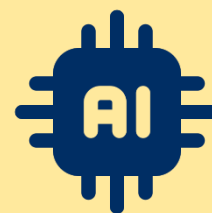
Target  
Customer  
List



Generates a ranked list of the top 2,000 male customers in Taipei with high loan probability.



GenAI



Creates personalized slogans and marketing messages based on the customer list.



# Business Benefits of Text2SQL and GenAI

## 1. No Coding Needed

- Query complex model results using simple language.
- No need to learn SQL or rely on engineers for every question.

## 2. Faster and Smarter Decisions

- Instantly filter and retrieve customer segments.
- Enables faster campaign planning and testing.

## 3. Empowers Non-Technical Teams

- Boosts confidence and ownership in data usage.
- Reduces dependency on technical teams for routine tasks.

## 4. Enables Instant Content Creation

- Generates slogans and marketing copy based on selected customer segments.
- Speeds up the launch of personalized campaigns.

# Demonstration

Chatbot

Textbox

Clear

[Use via API](#) · [使用Gradio構建](#) · [Settings](#)

# Demonstration

The same policy loan program uses different slogans for different customer segments, automatically generated through AILM.

## Cash flow needs



國泰人壽 My Insurance

保單借款 **超樹貸**

撥款**快速**  
讓你**靈活運用**資金

A woman in a business suit is smiling and holding a smartphone, with her hand raised in an 'OK' gesture.

## Back-to-school education fund needs



國泰人壽 My Insurance

**寶貝教育資金**  
時刻掛心

保單借款 **超樹貸**  
享**2.5%**專案利率優惠

A family (father, mother, and child) is walking outdoors in a park-like setting.



# Conclusions

# Conclusions

- AILMS improves policy loan marketing with AI-driven automation.
- The GBDT model enhances loan prediction accuracy for better targeting.
- Text2SQL simplifies data access for marketing teams.
- Generative AI personalizes marketing content, increasing engagement.
- AILMS supports IFRS 17 compliance and ALM optimization.
- Future focus: Expanding AI applications and improving personalization.

# Thank you! Obrigado!

## Questions?

Speaker Contact Details (Optional)



# DIVIDER SLIDE

Subtitle



# SLIDE TITLE

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